UNDERWATER BRIDGE INSPECTION REPORT

STRUCTURE NO. 2796

10TH AVENUE

OVER THE

MISSISSIPPI RIVER

DISTRICT 5 - HENNEPIN COUNTY, CITY OF MINNEAPOLIS

PREPARED FOR THE

MINNESOTA DEPARTMENT OF TRANSPORTATION

BY

COLLINS ENGINEERS, INC.

JOB NO. 3512 (CEI 120)

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

REPORT SUMMARY:

The substructure unit inspected at Bridge 2796, Pier 12, was in good condition below water with no structurally significant defects observed. The minor defects observed included light surface corrosion and gaps between the sheet piling surrounding the pier base concrete on all sides of the pier. The channel bottom was stable with no evidence of significant scour or appreciable changes since the previous inspection, with the exception of some aggredation of channel bottom material at the downstream fascia of the bridge near the north shore.

INSPECTION FINDINGS:

(A) Gaps were present in the steel sheeting at the east and west upstream quarter points. The gaps varied in width between the waterline and the channel bottom with a maximum width of 3 feet at the channel bottom on the east side of the pier. The gaps appear to be part of the sheet pile construction and do not affect the structural integrity of the pier.

(B) The steel sheeting was in good condition, with a uniform 1/8 inch layer of surface corrosion extending from the top of the sheeting to the channel bottom, along with light aquatic growth and silt below the waterline.

(C) A void between the horizontal C-channels and the vertical sheeting was observed at the east side upstream quarter point of the pier, 2.5 feet below the waterline. The void had a height of 2.5 feet and 2 feet of penetration.

(D) The sheet piling was slightly separated from the concrete around the base of the pier for a length of 20 feet along both sides of the pier.

RECOMMENDATIONS:

(A) Reinspect the submerged substructure unit at the normal maximum recommended (NBIS) interval of five (5) years.

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Licensed Professional Engineer under the laws of the State of Minnesota.

Daniel G. Stromberg

Date 6/30/2004 Registration No. 21491

Respectfully submitted,

COLLINS ENGINEERS, INC.

Daniel G. Stromberg
Registered Professional
Engineer, State of Minnesota

MINNESOTA DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

1. BRIDGE DATA

Bridge Number: 2796

Feature Crossed: The Mississippi River

Feature Carried: 10^{TH} Avenue

Location: District 5 - Hennepin County, City of Minneapolis

Bridge Description: The superstructure consists of a open-spandrel reinforced concrete arch supporting a reinforced concrete deck. The superstructure is supported on two reinforced concrete abutments and 19 reinforced piers numbered from the west end of the bridge. Only Pier 12 is located within the channel. No information on the foundation of Pier 12 was shown on the design drawings provided.

2. INSPECTION DATA

Professional Engineer/Team Leader: Shirley M. Walker, P.E.

Dive Team: Clayton G. Brookins, Michelle D. Koerbel

Date: October 1, 2002

Weather Conditions: Sunny, ± 65^{o} F

Underwater Visibility: ± 0.5 Feet

Waterway Velocity: ± 3.5 f.p.s.

3. SUBSTRUCTURE INSPECTION DATA

Substructure Inspected: Pier 12

General Shape: The pier consists of an oblong rectangular shaft with rounded ends. The base of the pier shaft is encased with steel sheet piling protection system which is pointed at the upstream end and filled with concrete.

Maximum Water Depth at Substructure Inspected: Approximately 16.4 feet.

4. WATERLINE DATUM

Water Level Reference: Top of spring line at Pier 12.

Water Surface: The waterline was approximately 9.8 feet below reference. Waterline Elevation = 725.5.

5. NBIS CODING INFORMATION (Minnesota specific codes are used for 92B and 113)

Item 60: Substructure: Code 7

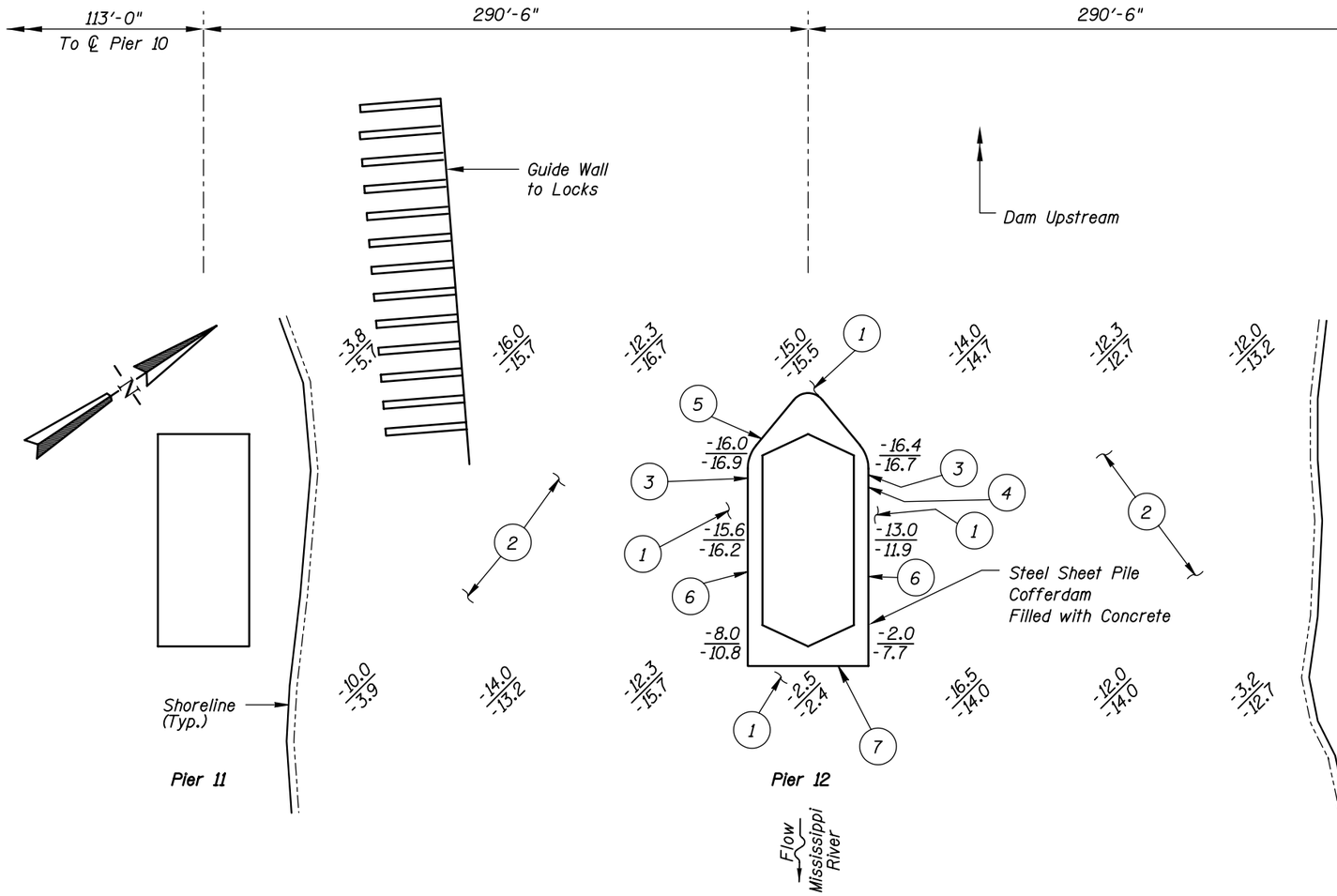
Item 61: Channel and Channel Protection: Code 8

Item 92B: Underwater Inspection: Code B/10/02

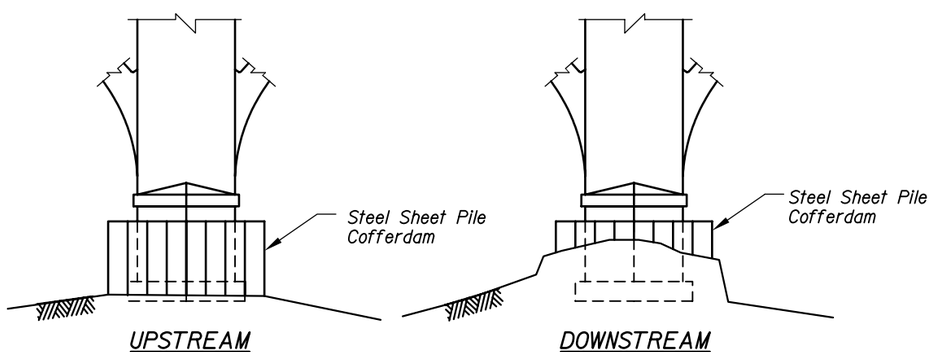
Item 113: Scour Critical Bridges: Code U/96

Bridge is scour critical because abutment or pier foundation is rated as unstable due to observed scour at bridge site.

_____ Yes __X__ No



SOUNDING PLAN



UPSTREAM DOWNSTREAM

TYPICAL END VIEW OF PIER 12

GENERAL NOTES:

1. Pier 12 was inspected underwater.
2. At the time of inspection on October 1, 2002 the waterline was located approximately 9.8 feet below the spring line at Pier 12. This corresponds with a waterline elevation of 725.5 based on the previous report dated September 17, 1997.
3. Soundings indicate the water depth at the time of inspection and are measured in feet.
4. Soundings were taken parallel to the bridge at about 1/4 point intervals between the substructure units.

INSPECTION NOTES:

(1) The channel bottom material, within 10 feet of the substructure unit, typically consisted of tightly packed riprap from 1 foot to 3 feet in size. Along the downstream end, the channel sloped up at a steep angle and was located approximately 2.4 feet below the waterline, the downstream channel bottom material consisted of cobbles of less than 6 inches in size and riprap from 1 foot to 4 feet in size.

(2) The channel bottom material consisted of a sandy gravel with 4 inches of probe rod penetration.

(3) Gaps in the lines of construction (not at interlocks), were observed in the steel sheeting at the east and west upstream 1/4 points with maximum widths located at the channel bottom. The west gap measured 15 inches in width and had a maximum penetration of 6 inches. The east side gap measured 36 inches in width and had no penetration.

(4) A void between the horizontal C-channels and the vertical sheeting was observed at the east side upstream 1/4 point of the pier at 2.5 feet below the waterline with a height of 2.5 feet and 2 feet of maximum penetration.

(5) The steel sheeting was in good condition with a uniform 1/8 inch layer of surface corrosion extending from the top of the sheeting to the channel bottom.

(6) The steel sheet piling was slightly separated from the concrete around the base of the pier for a length of approximately 20 feet along the east and west sides.

(7) There was a hole in the steel sheet piling at the downstream end measuring 1 inch in diameter.

Legend

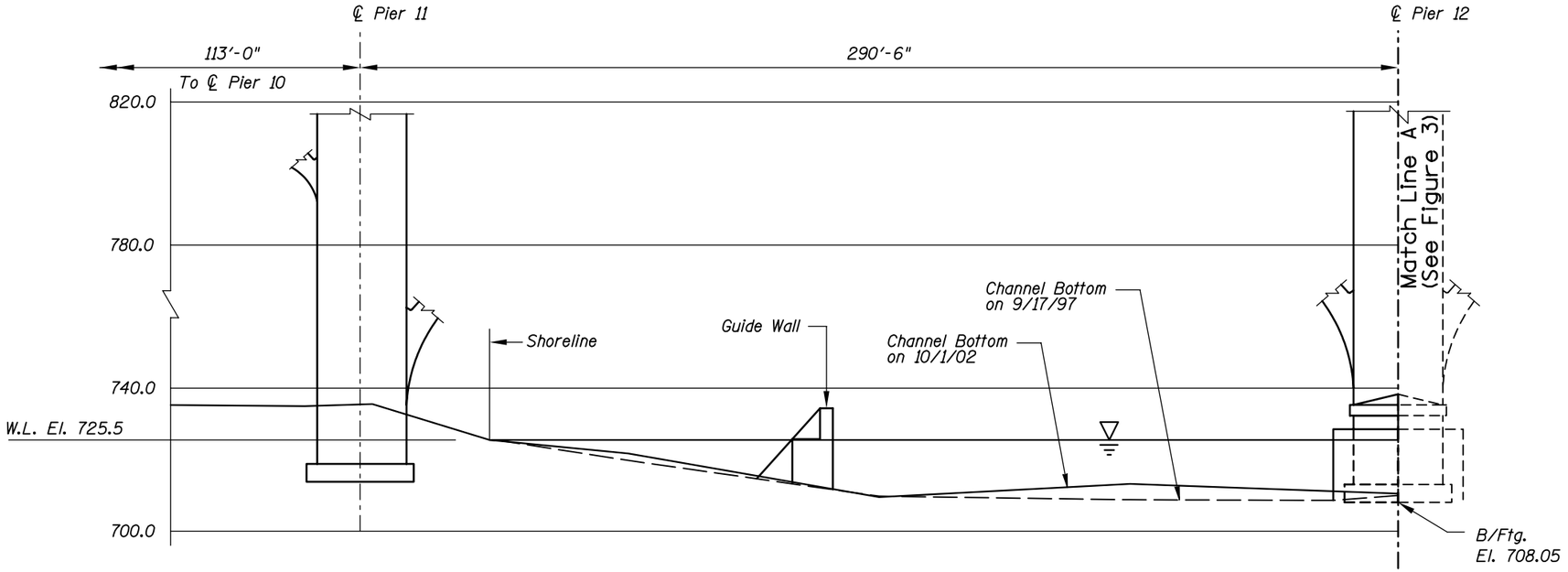
-14.0	Sounding Depth from Waterline (10/1/02)
-14.7	Sounding Depth from Waterline (9/17/97)

MINNESOTA
DEPARTMENT OF TRANSPORTATION
UNDERWATER BRIDGE INSPECTION

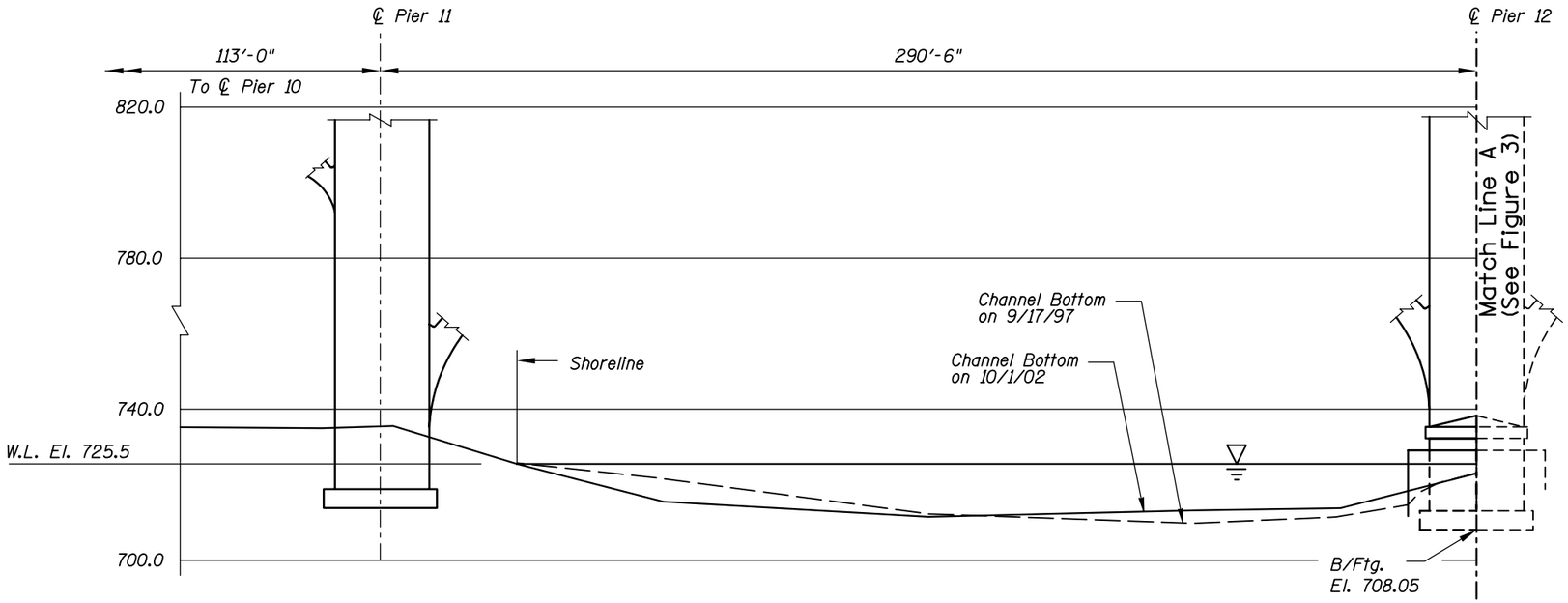
STRUCTURE NO. 2796
OVER THE MISSISSIPPI RIVER
DISTRICT 5, HENNEPIN COUNTY, CITY OF MINNEAPOLIS

INSPECTION AND SOUNDING PLAN

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: OCT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: NTS
Code: 35120120		Figure No.: 1



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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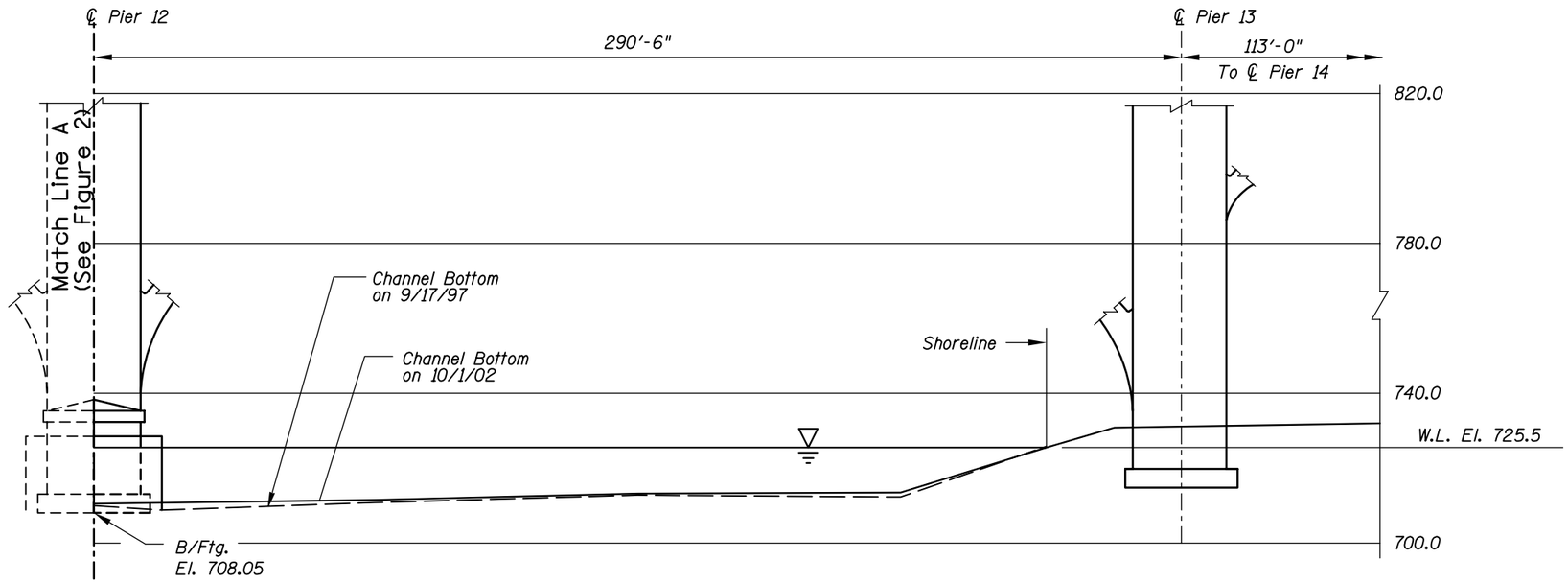
UNDERWATER BRIDGE INSPECTION

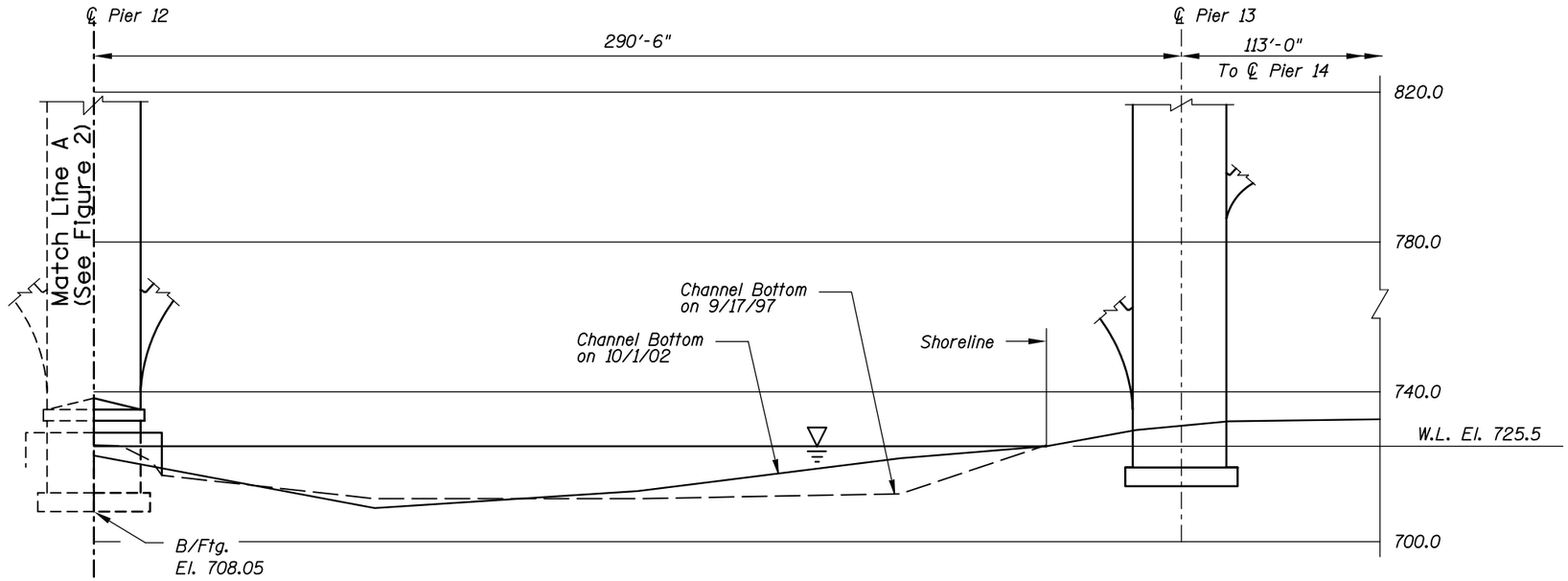
STRUCTURE NO. 2796
OVER THE MISSISSIPPI RIVER
DISTRICT 5, HENNEPIN COUNTY, CITY OF MINNEAPOLIS

UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	COLLINS ENGINEERS, INC.	Date: OCT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=40'
Code: 35120120		Figure No.: 2



UPSTREAM FASCIA PROFILE



DOWNSTREAM FASCIA PROFILE

Note:

Refer to Figure 1 for General Notes.

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UNDERWATER BRIDGE INSPECTION

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UPSTREAM AND DOWNSTREAM FASCIA PROFILES

Drawn By: PRH	**COLLINS ENGINEERS, INC.**	Date: OCT. 2002
Checked By: MDK	300 W. WASHINGTON, STE. 600 CHICAGO, ILLINOIS 60606 (312) 704-9300	Scale: 1"=40′
Code: 35120120		Figure No.: 3

Photograph 1. View of the Upstream Nose of Pier 12, Looking East.

Photograph 2. View of the South Side of Pier 12, Looking Northwest.

Photograph 3. View of the Downstream Nose of Pier 12, Looking West

Photograph 4. View of North Side of Pier 12, Looking Southwest.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES
DAILY DIVING REPORT

INSPECTORS: Collins Engineers, Inc. DATE: October 1, 2002
ON-SITE TEAM LEADER: Shirley M. Walker, P.E.
BRIDGE NO: 2796 WEATHER: Sunny, "65° F
WATERWAY CROSSED: The Mississippi River
DIVING OPERATION: X SCUBA SURFACE SUPPLIED AIR
OTHER
PERSONNEL: Clayton G. Brookins, Michelle D. Koerbel
EQUIPMENT: Scuba, U/W Light, Scraper, Sounding Pole, Lead Line, Probe Rod, Boat, Camera
TIME IN WATER: 11:15 A.M.
TIME OUT OF WATER: 12:00 P.M.
WATERWAY DATA: VELOCITY " 3.5 f.p.s.
VISIBILITY "0.5 feet
DEPTH 16.4 feet maximum at Pier 12
ELEMENTS INSPECTED: Pier 12
REMARKS: Overall, Pier 12 was in good condition with no structurally significant defects observed. A uniform layer of surface corrosion was observed on the steel sheeting below water, and all steel sheeting interlocks were intact. The channel bottom consists of large diameter riprap all along pier except for one 20 foot length along the south side of the pier. A void, up to 2.5 feet high, was observed between the horizontal C-channels and the vertical sheeting near the east side upstream 1/4 point of the pier. Gaps, which are not a structural concern, were observed in the steel sheeting construction at the east and west upstream 1/4 points with maximum widths located at the channel bottom.

FURTHER ACTION NEEDED: _____ YES ____X___ NO

Reinspect the submerged substructure units at the normal maximum recommended (NBIS) interval of five (5) years.

MINNESOTA DEPARTMENT OF TRANSPORTATION
OFFICE OF BRIDGES AND STRUCTURES

UNDERWATER INSPECTION CONDITION RATING FORM

BRIDGE NO. 2796
INSPECTORS Collins Engineers, Inc.
ON-SITE TEAM LEADER Shirley M. Walker, P.E.
WATERWAY CROSSED The Mississippi River

INSPECTION DATE October 1, 2002

NOTE: USE ALL APPLICABLE CONDITION DEFINITIONS AS DEFINED IN THE MINNESOTA RECORDING AND CODING GUIDE INCLUDING GENERAL, SUBSTRUCTURE, CHANNEL AND PROTECTION, AND CULVERTS AND WALL DEFINITIONS TO COMPLETE THIS FORM.

CONDITION RATING

			SUBSTRUCTURE						CHANNEL					GENERAL					
UNIT REFERENCE NO.		MAXIMUM DEPTH OF WATER	PILING	COLUMNS, SHAFTS, OR FACES*	FOOTINGS	DISPLACEMENT	OTHER	OVERALL SUBSTRUCTURE CONDITION CODE*	SCOUR	EMBANKMENT EROSION	EMBANKMENT PROTECTION	OTHER (DRIFT/DEBRIS)	OVERALL CHANNEL & PROTECTION CONDITION	CONCRETE	STEEL	TIMBER	LOSS OF SECTION	PREVIOUS REPAIR OR MAINTENANCE	OTHER
	UNIT DESCRIPTION	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
	Pier 12	16.4’	7	7	N	9	N	7	8	N	N	8	8	N	7	N	8	N	N

*UNDERWATER PORTION ONLY

REMARKS: Overall, Pier 12 was in good condition with no structurally significant defects observed. A uniform layer of surface corrosion was observed on the steel sheeting below water, and all steel sheeting interlocks were intact. The channel bottom consists of large diameter riprap all along pier except for one 20 foot length along the south side of the pier. A void, up to 2.5 feet high, was observed between the horizontal C-channels and the vertical sheeting near the east side upstream 1/4 point of the pier. Gaps, which are not a structural concern, were observed in the steel sheeting construction at the east and west upstream 1/4 points with maximum widths located at the channel bottom.

NOTES: ATTACH SKETCHES AS NEEDED, IDENTIFY REMARK BY REFERRING TO UNIT REFERENCE NO. AND REMARK NO.
USE GENERAL SECTION TO IDENTIFY OVERALL PRESENCE OF SPALLS, CRACKS, CORROSION, ETC.